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ABSTRACT

Funding constraints had resulted in the need to increase the size of classes conducted by the Business and Technical Division of Piedmont Technical College. In the absence of budget limitations classes were split when enrollments exceeded 30 students. This study was initiated to examine the relationship of class size to course grade point average (GPA) during a two-year period. The 12 courses chosen for the study had both high (over 30) and low (30 or less) students, were conducted by full-time staff, and were of the same level of difficulty. A Z-test at the .05 level of significance was used to test the null hypothesis that there is no significant difference in course GPA's of students in large classes and those in small classes. The Z-value of .2881 was less than 1.96, the area of concern under the normal curve, resulting in an inability to reject the null hypothesis. The difference between the mean GPA's of the large and small class groups was statistically insignificant. The results of this study form the basis for formulating class size policy beginning fall 1978. A review of the literature revealed that findings of studies on class size varied considerably, and that although much research supported small classes, there appeared to be some consistence in the findings that class size had little effect on student performance. A bibliography is included. (Author/MB)

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THE EFFECT OF INCREASING CLASS SIZE ON THE GRADES OF STUDENTS IN THE BUSINESS CURRICULUM AT PIEDMONT TECHNICAL COLLEGE

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ABSTRACT

Funding constraints had resulted in the need to increase the size of classes conducted by the Business and Technical Division. In the absence of budget limitations classes were split when enrollment exceeded 30 students. Severe fund limitations in the last two fiscal years had prompted the administration to make a more conscious effort to conduct classes with a larger number of students. This procedure was followed during the academic year 1976-77. Increased efforts were made to do so in the fall quarter of 1977. At the end of the fall quarter the Business Division Dean suspected that larger classes were correlated with lower grades. As a result, this study was initiated to examine the relationship of class size with course grade point averages during a two year period. The investigation focused on the collection and interpretation of data regarding class size and course grades. A Z-test at the .05 level of significance was used to test the null hypothesis that there is no significant difference in course grade point averages of students in large classes and those in small classes. At the .05 level for a two-tailed test, the Z value of .2881 was less than 1.96, the area of concern under the normal curve. As a result the null hypothesis could not be rejected. The difference between the means of the large and small class groups was statistically insignificant. The results of this study will be used as a basis for formulating class size policy beginning fall quarter, 1978.

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THE EFFECT OF INCREASING CLASS SIZE ON THE GRADES OF STUDENTS IN THE BUSINESS CURRICULUM AT PIEDMONT TECHNICAL COLLEGE

INTRODUCTION

This study was undertaken to determine the effect on grades of an administrative decision to increase the class size in a number of classes in the business curriculum of Piedmont Technical College.

Historically Piedmont Technical College (TEC) had a generally understood but unwritten policy to limit class size to approximately 30 students. In the last several years, funding constraints within the South Carolina Technical Education system had resulted in the need to examine periodically this class size policy. This examination focused primarily on the Business and Technical Division where enrollments were typically higher than in the other divisions of the college. In this division the decision to split classes had been a fairly constant one. In recent years with reduced funding this decision had become a more vexing one. On the one hand, some faculty members believed, intuitively, that student achievement suffered when classes were large. On the other hand, the splitting of classes resulted in additional personnel costs. As a result of faculty concern the administration forced large classes only where budget allocations were particularly severe. Even then there was

some reluctance to do so as the dean and academic officer were supportive of faculty concern regarding the adverse effect on student achievement. Consequently during the last three years of funding constraints, instruction had been given in both large and small class environments. However, more severe budget limitations in the last two fiscal years had forced the administration to make a concerted effort to conduct classes with a larger number of students. A number of larger classes were conducted in calendar year 1976. Forced by an even lower budget appropriation in the fall of 1977, a larger number of courses in the Business and Technical Division were conducted in a large class environment.

At the completion of the fall quarter, 1977, there was a general feeling by the Dean of Business and the Vice President for Academic Affairs that increasing class size resulted in lower grades. A perusal of fall quarter grades and increased feedback by faculty reinforced this perception and established the need for a more comprehensive study of the relationship between class size and grade point averages (GPA).

The purpose of this investigation was to determine if there was a significant difference in course grades of students in small classes in comparison with those in large classes.

This investigation focused on the collection and interpretation of data regarding class size and course grade point average (see definitions page 15). The research design included elements of descriptive and inferential research. In the process of arranging class size and course grade point average data, descriptive research techniques were used to display the data to facilitate simple comparisons. During the analysis phase of the study inferential statistics were used to test the significance of the difference in course grade point averages in large and small classes. Grade point average and class size data were arrayed in a frequency distribution to determine the characteristics of the distribution. Additionally inferential statistics were applied to class size, the principal variable of interest, and course grade point averages, the dependent variable. The Z-test at the .05 level of significance was used to test the null hypothesis. There was no significant difference in the course grade point averages of students in large classes and those in small classes.

BACKGROUND AND SIGNIFICANCE

Piedmont Technical College is one of 16 Technical Education Centers/Colleges in the State System. It is supported financially by Federal, State and local monies. The latter represents revenues from student tuition and from seven surrounding counties for the maintenance of the physical plant. Federal funds are those provided to the college to manage a number of grant programs. The single largest source of revenue for the college is the annual allocation from the State Board for Technical and Comprehensive Education. This allocation was designed for and restricted to the payment of faculty and staff salaries. In each of the past two fiscal years the TEC Audit Report (1977) validated substantially reduced state allocations. In Fiscal Year 1977, the allocation of $1,391,050 was $100,000 less than that provided in FY76. In Fiscal Year 1978, the state allocation was $125,000 less than the FY77 allocation.

Throughout the South Carolina Technical Education System, funding has been a problem for the last several years. From 1962 to 1977, the TEC system's primary mission has been to provide trained manpower to stimulate statewide capitol investment and general economic growth. A 1977-78 publication concerning the future of technical education indicated that demand for training had far exceeded the state's funding during the last three years and that inflation

had reduced the value of the TEC system's appropriated funds. As a result there has been the need to limit enrollments to accommodate austere increments in state appropriations. Throughout the system full-time equivalency (FTE) curriculum enrollment decreased by 9 percent because of inadequate funding. For the past three years, Piedmont TEC's enrollment in terms of FTE students has remained stable at approximately 1800 students.

To accommodate three years of austere funding, a number of economy measures have been instituted. Since the major shortfall has been in the salary area, concerted efforts were made to reduce expenditures here. For example, forty percent of instruction was performed by part-time faculty. At an average pay of $6.25 an hour, significant economies have been realized. Additionally, in the fall of this year the Dean of the Business and Technical Division made a more conscious attempt not to split large classes. In this division where enrollments were higher than in the other divisions of the college, the decision to split classes had become a frustrating one. Often, during restrictive funding periods, the dean had not limited class size when class enrollments exceeded 30 students. Several classes were not split in calendar year 1976 and, on occassion, earlier. However during the fall of 1977, when a significantly lower appropriation dictated the need for a closer review of the

class size policy, the initial thrust was to enlarge classes.

A review of fall quarter grades and an increasing concern of some faculty that grades were lower in larger classes prompted the dean to request an investigation of these concerns (see Appendix A).

A preliminary review of literature reveals that there is a considerable body of research dealing with class size. The following publications illustrate the vast disparity in research results of class size and academic performance. Among the results of a Madison Public Schools study (1976) to determine the effects of class size on reading achievement were the findings that class size is virtually nonpredictive of reading achievement. This study also concluded that outcomes of research on the effects of class size are inconsistent. This conclusion was supported by an early study by Blake (1954) who reviewed 267 studies investigating class size. Twenty-two met Blake's research design criteria and 11 of these used student achievement as the outcome variable being measured. Five of these studies supported the hypothesis that small classes produced higher achievement, the other six did not. Smith's (1971) study of 34 research papers investigating class size concludes that for the most part research findings show that class size has little or no effect on student performance. Templeton (1972) surveyed current literature dealing with the effect of class size on both school

finance and educational quality. While there is a general agreement on the telling impact of class size on school budgets, there is little agreement on the effect of class size on educational quality.

In a study of the influence of class size on student performance in a secondary school science laboratory, De Angelis (1977) found no significant differences in overall student achievement. In this study the influence of class size on student performance was tested by comparing two homogeneously grouped sections of ninth grade science students. One section consisted of 46 students and the other 23. Using standard achievement tests as a measure, no significant differences were found in student achievement after a six-month period.

Bartelt and Williams (1971) in a study of the relationship of class size and various cognitive variables to academic achievement, concluded that what a student prefers in terms of tests and type of class may have nothing to do with his/her performance. Further, that in spite of the lack of significance between achievement and class size "we are left with not only the students preference but with the teachers preference for small groups."

Other studies have found that class size was a factor in student achievement. In a 1977 publication "The Question of Class Size", the National Educational Association, in concert with the Ohio Education Association, makes a case that class

size does make a difference in terms of creativity, decline of learning and behavior problems, better class control, problem-solving and retention, and the amount of opportunity for students to participate and express themselves orally.

Brantley (1974) finds that class size was a factor in performance of college level physical science students. He concluded that the lecture method with small class size was shown to produce higher achievement than the audio-tutorial method with large class size. In a broader context, The National Education Association's Reference and Resource Series published a document on class size (1977) that was designed to support the need for small classes. It included nine defensible generalizations regarding small classes and references which support them. This document contained convincing argument for small classes.

Suffice it to say that findings of studies on class size varied considerably. While there is a large body of research supporting small classes there does appear to be some consistence in the findings that class size had little effect on student performance. Moreover, there is little disagreement on the fiscal impact of class size. With regard to this issue, it appears that the current scarcity of funds within the South Carolina Technical Education System is far from transitory. Austere budget allocations could very well be a way of life for an extended period.

Current indications are that funding limitations will be equally severe in FY1979. In a February 9, 1978 address to the South Carolina House Ways and Means Committee, the Greenville News noted that the Executive Director of the State Board for Technical and Comprehensive Education made a plea for additional funds. He indicated that a $1.7 million increase was "not nearly enough" - that a $10.5 million increase was required to operate the TEC system.

This year the gulf between TEC requirements and the Budget and Control Board's appropriation recommendation was larger than in the past several years. In the absence of legislative relief TEC faced another lean year.

As a result it has become increasingly important for Piedmont TEC to understand the effect on education of policy formulated to achieve essential budget economies. If, in fact, the execution of some policies have an adverse effect on students, then there is a need to understand this effect and to change policies or develop classroom strategies that counter the effect. One aspect that needed to be addressed quickly because of faculty concern and fiscal implications was the question of class size and student achievement. While prior studies provided an understanding of the complexity of the issue, results varied. It was apparent to the writer that understanding the relationship of student grades and class size at Piedmont TEC required

an individualized study including statistical analysis. The Research and Evaluation Module provided the background and tools with which to conduct such a study. During the review of literature the most meaningful studies had a research design with a strong statistical base. The subject matter of the Research and Evaluation Module provided the background necessary for a more complete understanding of the literature reviewed.

PROCEDURES

As indicated previously, the sample for this study was taken from the Business and Technical Division where the large enrollment precipitated the need for this study. Initially the dean of this division recomuended 25 courses for possible study; these courses are listed in Appendix B. To establish a meaningful sample while controling some of the extraneous variables, courses that met the following criteria were included in the study.

1. Courses that had had both high (over 30) and low (30 or less) student enrollment to eliminate the business math, statistics and accounting courses that have been kept small by design due to the heavy emphasis on quantitive skills.

2. Courses that had been conducted by full time staff to eliminate any variability which might be attributed to part-time instruction.

3. Courses that had been taught in more than one quarter to eliminate any variability which might be attributed to the academic quarter.

4. Courses that frequently had high enrollment and had not been split into smaller classes when funding constraints were in effect.

5. Courses of the same level of difficulty to eliminate any variability which might be attributed to difficulty

of course content.

6. Courses representative of those in the Business and Technical Division.

Twelve courses met this requirement and were included in the study (see Appendix C). Class size and mean grade assigned for each of the twelve courses taught over a two year period were derived from class enrollment and grade sheets. Each class enrollment and grade sheet was reviewed and class size information was extracted and recorded. The mean of grades assigned for each class were tabulated and recorded similarly. Since complete data on class size was not available prior to the Fall Quarter, 1975, the study included data from all of the selected courses conducted during the period beginning with the Fall Quarter 1975 and ending with Fall Quarter 1977. During this period, the courses were taught 68 times - 31 times in a small class environment and 37 times in large classes.

As a preliminary step, the extracted data were grouped by class size. All classes with 30 or less students were grouped and summarized in a descriptive table with columnar headings of Classes, Class Size, Class Grade Point Average and Weighted GPA (see Appendix D). The mean and the weighted mean for each class were computed for these data. In the latter, a weighted mean was computed to assess the influence of the numbers of students in the small class grouping.

Similar grouping and treatment were applied to classes with over 30 students (see Appendix E).

As a second step, data from both groups were arrayed in three frequency distributions of the course grade point averages. The first two tables displayed the grade distribution characteristics of large and small classes, by the number of classes and secondly, the grade distribution by percentages of classes (see Tables 1 & 2). The other frequency distribution displayed the numbers and percentages of students (see Table 3).

As a third step, a preliminary observation of the data was made by visually comparing the computed means of both groups. Subsequently the frequency distributions were reviewed to determine the characteristics of the distribution of grade point averages.

As a final step in the research design a Z-test at the .05 level of significance was used to test the null hypothesis that there is no significant difference between course grade point averages of students in large classes and those in small classes. Two Z-tests were computed. The first used unweighted data and the second, weighted data to capture the influence of numbers of students in each class of each group.

Variables and Operational Definitions

1. Independent Variable - Class size was the principal

variable of interest in this study. It was defined as the number of students enrolled in each course after the completion of the drop/add period. A large class was one with over 30 students. A small class was a class with 30 or less students.

2. Dependent Variable - The dependent variable in this investigation was grade point average. The grade point average was the arithmetic mean of grades of students in each class under study. The following grading system was used: A, 4.00; B, 3.00; C, 2.00; D, 1.00; F, 0.00.

Basic Assumptions

1. Since many of the courses at Piedmont Technical College were taught only once or in some cases, twice each academic year, a basic assumption was made that it was statistically sound to compare courses with similar degrees of difficulty. An accompanying assumption was made that the Dean of Business and Technical Division identified accurately comparable courses with similar degrees of difficulty.

2. It was assumed that the student groups under study were reasonably homogeneous.

Limitations

1. There were a number of limitations to this study. The major limitation was that the sample chosen had defined boundaries that precluded generalizing beyond the particular courses selected.

2. The absence of accurate class size data prior to the Fall Quarter 1975 resulted in a smaller sample than would have been preferred.

3. Due to time constraints the scope of this study was narrower than preferred. Additional variables such as student and instructor attitudes about class size may have provided additional meaningful data.

Delimitations

As a result of the limitations, of this research, this study had direct application only to the Business and Technical Division of Piedmont Technical College.

Definition of Terms

Academic Officer - This referred to the Vice President for Academic Affairs.

Class Size - The number of students enrolled in each of the courses in the study after the drop/add period.

Course Grade Point Average - The result when the class grade of each student was translated to a numeric score based on a 4.00 grading system, added to the score of the other students in that class and divided by the number of students in that class. The terms "grade point average" when used in the context of "course grade point average" represented only the grades achieved in that class. At no time in this study does the term apply to grade points earned for all courses completed by the student.

Dean - This term referred to the Dean of the Business and Technical Division of the College.

Drop/Add period - The three week period after registration when students can enroll in the course for credit.

Grade point average - This referred to course grade point average.

Student achievement/performance - The grade point averages of the students enrolled in a particular course.

Weighted Mean - The result when the average GPA of each class was multiplied by the number of students in the class.

RESULTS

Grade point average and class size data for small and large classes were recorded and averaged (see Appendices D & E). As indicated in the Appendices and in Table 1 below, the average GPA for small classes was 2.34 and for large classes was 2.32, a difference of .02. In both groups, the distribution of grades followed a similar pattern.

TABLE 1

Distribution of Grade Point Averages of Small and Large Classes

GPA Intervals	Number of Classes with Average in Interval	
	Small Classes	Large Classes
3.50-4.00	0	0
3.00-3.49	3	4
2.50-2.99	8	7
2.00-2.49	15	19
1.50-1.99	4	7
1.00-1.49	1	0
	Average GPA = 2.34	Average GPA = 2.32
	Difference .02	

Since Table 1 is distorted somewhat because of the unequal number of classes in each group, 31 small classes versus 37 large classes, Table 2 was developed to reflect the percentages of class distribution. Table 2 did not reflect any major variances. It did reflect that approximately the same percentage of classes in each group achieved a GPA interval of 3.00 - 3.49. This was also true for the 2.00 - 2.49 interval. Interesting to note that there was a greater achievement by small classes at the 2.50 - 2.99 level. Conversely the small class group registered the sole entry at the 1.00 - 1.49 GPA level.

TABLE 2

Percentage Distribution of Grade Point Averages of Small and Large Classes

GPA Intervals	Percentage of Classes with Average in Interval	
	Percentage of Small Classes	Percentage of Large Classes
3.50-4.00	0	0
3.00-3.49	9.7	10.9
2.50-2.99	25.8	18.9
2.00-2.49	48.3	51.3
1.50-1.99	13.0	18.9
1.00-1.49	3.2	0
	100.0	100.0

To determine the influence of the numbers of students in each class grouping, a frequency distribution was developed to discern if a significantly different distribution of grades would evolve. Table 3 reflects this distribution.

TABLE 3

Distribution of Grade Point Averages of Small and Large Classes

GPA Intervals	Small Classes Group		Large Classes Group	
	No. of Students	% of Students	No. of Students	% of Students
3.50-4.00	0	0	0	0
3.00-3.49	41	6.4	191	11.4
2.50-2.99	182	28.8	299	17.9
2.00-2.49	311	49.2	815	48.9
1.50-1.99	80	12.6	360	21.6
1.00-1.49	19	3	0	0
	633	100.0	1665	100.0
	Weighted Average GPA = 2.33		Weighted Average GPA = 2.29	
	Difference = .03			

There were a number of similarities between the first two tables and Table 3 but also some interesting differences. While the largest number and percentage of students in each group achieved within the 2.00 - 2.49 interval, in the small class group, the next highest number and percentage occurred at the 2.50 - 1.99 level. In the large class group the next highest number and percentage achieved at the 1.50 -

1.99 level. Conversely, a higher percentage of students in large class group achieved at the 3.00 - 3.49 interval, 11.4 percent for large classes and 6.4 percent for the small classes. Overall there was an increase in the difference in the means of the weighted and unweighted class size data. In the former, the difference in the means was .02. The latter showed a difference of .03.

Observational comparisons of the means of both groups indicated that the difference probably was not statistically significant. While a review of the grade distribution patterns revealed some differences, these data did not reveal any major contradictions in terms of a significant difference in the GPA of the two groups. The Z-Test at the .05 level of confidence confirmed this perception.

A $\bar{z}$ value of .1814 was derived from a computation of the unweighted data and a $\bar{z}$ of .2881 for the weighted data. At the .05 level for a two-tailed test the $\bar{z}$ value in each case was less than 1.96, the area of concern under the normal curve. As a result, the null hypothesis could not be rejected. The difference between the two means was statistically not significant. Table 4 showes the formula and values in computing $\bar{z}$.

TABLE IV

$\bar{z}$ Formula and Computation Values

$$\bar{z} = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1 - 1} + \frac{\sigma_2^2}{N_2 - 1}}}$$

Class Data		Weighted Data	
$N_1 = 31$	$N_2 = 37$	$N_1 = 31$	$N_2 = 37$
$M_1 = 2.3454$	$M_2 = 2.3241$	$M_1 = 2.3313$	$M_2 = 2.2986$
$\sigma_1 = .500$	$\sigma_2 = .428$	$\sigma_1 = .4915$	$\sigma_2 = .4227$
$\bar{z} = .1814$		$\bar{z} = .2881$	

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to determine if the decision to enlarge classes was adversely effecting student performance. The major factor prompting the decision to enlarge classes was a financial one as class size has a direct relationship to cost. Smaller classes translate to more instructors, and consequently increased expenditures. However, the increasing faculty perception that grades fall significantly in a large class environment had become a major concern of the dean and institutional officers. Recognizing that the scarcity of funds within the South Carolina Technical Education System seems likely to continue, there was a real need to know if, in fact, there was a significant difference in grades of students in large and small classes. The methodology followed to determine if there was a difference was essentially a study of course grades in small and large classes over a two year period. The null hypothesis tested was that there was no significant difference in grades. Using a Z-Test as described in the preceding chapter, the null hypothesis could not be rejected.

Within the cited limitations of this study, there is no evidence that the size of classes has resulted in a significant difference in grades. As a result, there is some justification to expanding selectively the size of more

classes within the Business and Technical Division and considering doing so in other divisions of the school.

The findings of this study were consistent with a number of other studies which used student achievement as the dependent variable. Smith's (1971) study of 34 research papers concluded that for the most part, class size had little effect on student achievement. In Templeton's (1972) survey of current literature dealing with the effect of class size on both school finance and educational quality, he noted that there was little agreement on the effect of class size on educational quality. As mentioned in Chapter 2, there were a number of studies that concluded that class size did effect student performance. It is clear to the writer that a number of variables influence class size studies to varying degrees depending upon the setting within which the study was conducted. While a review and analysis of previous work in the field was crucial for a more comprehensive understanding of the subject, the answer to the Piedmont TEC dilemma necessitated a study of the variables at work here.

The findings that class size did not significantly effect grade point averages have a number of implications. Overall the study has provided the institutional officers and deans with a better understanding of the class size question

in the field and at Piedmont TEC. This understanding should be helpful in formulating class size policy for the academic year 1978-79.

From an administrative standpoint it will minimize the grade variable when making class size decisions. Historically when the Dean of the Business and Technical Division faced the decision to split a large class into smaller elements, the effect on grades was the major consideration because the faculty perceived that grades were significantly lower in large classes. As a result of this study the dean will be in a position to make this decision based on a number of other considerations, including physical characteristics of classroom, grading workload, difficulty of course content and budget position.

For the faculty, this study may provide added insights into the class size question and may mollify some concerns when they are scheduled to instruct in a large class environment. There is likely to be little change in the preference of many instructors for small classes, but there may be more understanding of their assignment to teach large classes.

The immediate implications of the study for some students will be that their instruction will be conducted with a larger number of students in the class. Future implications

are unknown. There were indications in other studies that class size does make a difference in terms of creativity, decline of learning and increase in behavior problems. As a result it would not be prudent to close the door on the class size question.

While this study has provided some answers regarding the effect on grades of class size, the scope of the study was narrow and cannot be used to generalize beyond the courses studied within the Business and Technical Division. It may be appropriate to establish a follow-on experimental research design in September 1978 to study other effects of increasing class size.

Recommendations

In view of the austere budget outlook within the TEC system and the results of this study, the following recommendations are made:

1. That the writer be permitted by the president to capsulize the results of this study and circulate the results in an appropriate form to the faculty.

2. That the institutional officers in concert with the deans, and with faculty representation, formulate a class size policy that considers the findings of this study.

3. That an increased number of classes be conducted in a large class environment as an outcome of the policy.

4. That provision of classroom space be placed as a top institutional priority for the proposed increase in class size.

5. That the Dean of the Business and Technical Division establish an experimental design project which includes other variables such as failures, drop out rates, student and instructor attitude, in September 1978 to study their effects on enlarged classes.

The projected funding situation at Piedmont Technical College and for that matter within the South Carolina Technical Education System will require increasing economies in order to continue to provide for modest increases in student enrollment while faced with decreasing dollars. It is important to achieve the necessary economies without a degredation of the educational process. Since salaries represent the single largest budget category it will continue to be viewed as a potential source for reduced expenditures. It is important to know more of the effects on the educational process when formulating policy to achieve these salary economies. Hopefully, the results of this study may provide added insight to this policy formulation.

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APPENDICES

APPENDIX A

Piedmont Technical College

EMERALD ROAD - DRAWER 1208 - GREENWOOD, S. C. 29646 PHONE 803-223-8357

LEX D. WALTERS
President

March 1, 1978

Mr. John Morgan
Vice President Business Affairs
Piedmont Technical College
Greenwood, South Carolina 29646

Dear John:

As Piedmont TEC's instructional budget has become smaller each year since 1975, it has become necessary to schedule more and more large classes. At the same time, the faculty is becoming increasingly critical of this practice. While there are undoubtedly several reasons for this resistance, the one they articulate is that grades are lower in the larger classes.

At the present time, we have no statistical data to prove or disprove this theory. It would be very helpful to this division if you could do a study of this problem.

Since most of our courses are taught only once each academic year, we will have to develop a method for comparing similiar courses rather than exact courses. I feel that it would be statisticly sound to compare courses of approximately the same difficulty. As an example, it appears that MGT 101 "Principles of Management" could be compared to courses such as MGT 201 "Personnel Management," and MGT 121 "Small Business Management." If you concur with this premise, I will be happy to furnish you with whatever number of courses you will require.

Sincerely,

C Baumeister

C. Baumeister, Dean
Business and Technical Division

CB/eb

BOARD OF COMMISSIONERS: W. L. HEANER, JR. CHAIRMAN, GREENWOOD - THOMAS H. GRESHAM, V. CHAIRMAN, ANDERSON - [illegible]
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APPENDIX B

Courses Recommended for Study

COURSE	TITLE
MGT 101	Principles of Management
MGT 111	Office Management
MGT 201	Personnel Management
MKT 118	Retailing I
MKT 121	Marketing I
MKT 133	Salesmanship
MKT 214	Advertising
ECO 104	Economics I
ECO 105	Economics II
ECO 106	Economics III
ECO 116	Basic Economics
HUS 111	Human Services I
HUS 210	Supervised Field Placement III
HUS 215	Behavior modification
PSY 201	General Psychology
PSY 122	Personal Interpersonal Adjustment
PSY 242	Human Growth and Development
PSY 225	Counseling & Interviewing Techniques
PSY 211	Abnormal Psychology
PSY 216	Group Dynamics I
PSY 245	Counseling Techniques
SOC 101	Introduction to Sociology
SOC 102	Marriage & Family
SOC 205	Social Problems

APPENDIX C

Courses Selected for Study

COURSE	TITLE
MGT 101	Principles of Management
MGT 121	Marketing I
MGT 133	Salesmanship
ECO 116	Basic Economics
HUS 111	Human Services I
PSY 201	General Psychology
PSY 122	Personal and Interpersonal Adjustment
PSY 225	Counseling and Interviewing Techniques
PSY 211	Abnormal Psychology
SOC 101	Introduction to Sociology
SOC 102	Marriage and Family
SOC 205	Social Problems

APPENDIX D

SMALL CLASSES

Classes	Class Size	Class GPA	Weighted GPA
1	8	1.71	13.68
2	10	2.30	23.00
3	12	3.25	39.00
4	13	3.00	39.00
5	14	2.92	40.88
6	14	2.00	28.00
7	15	2.31	34.65
8	16	3.18	50.88
9	18	2.00	36.00
10	18	2.47	44.46
11	18	2.82	50.76
12	19	2.62	49.78
13	19	1.06	20.14
14	19	2.17	41.23
15	20	2.24	44.80
16	20	2.31	46.20
17	21	2.43	51.03
18	21	2.85	59.85
19	22	2.05	45.10
20	22	1.68	36.96
21	23	2.86	65.78
22	24	2.43	58.32
23	25	1.65	41.25
24	25	1.63	40.75
25	26	2.00	52.00
26	26	2.12	55.12
27	28	2.65	74.20
28	28	2.21	61.88
29	29	2.68	77.72
30	30	2.68	80.40
31	30	2.43	72.90
	633	72.71	1,475.72

$$\text{Mean GPA} - \bar{x} = \frac{72.71}{31} = 2.34$$

$$\text{Weighted Mean GPA} - \bar{x} = \frac{1475.72}{633} = 2.33$$

APPENDIX E

LARGE CLASSES

Classes	Class Size	Class GPA	Weighted GPA
1	31	2.42	75.02
2	32	2.28	72.96
3	32	2.33	74.56
4	33	2.17	71.61
5	34	2.32	78.88
6	34	2.66	90.44
7	35	2.00	70.00
8	36	2.63	94.68
9	37	1.86	68.82
10	38	1.92	72.96
11	38	2.43	92.34
12	39	2.77	108.03
13	39	3.33	129.87
14	40	2.80	112.00
15	40	2.37	94.80
16	40	1.84	73.60
17	41	2.53	103.73
18	42	2.18	91.56
19	42	2.08	87.36
20	45	2.07	93.15
21	46	2.48	114.00
22	46	2.13	97.98
23	47	3.02	141.94
24	47	1.85	86.95
25	48	2.95	141.60
26	48	2.04	97.92
27	49	2.27	111.23
28	49	1.98	97.02
29	49	2.11	103.39
30	50	2.09	104.50
31	50	3.17	158.50
32	54	2.03	109.62
33	55	3.00	165.00
34	56	1.52	85.12
35	61	2.57	156.77
36	69	2.22	153.18
37	93	1.57	146.01
	1,665	85.99	3,827.10

Mean of GPA - $\bar{x} = \frac{85.99}{37} = 2.3241$

Weighted Mean of GPA - $\bar{x} = \frac{3827.10}{1665} = 2.2986$